Achievement Standard Physical Education 90963: Demonstrate understanding of the function of the body as it relates to the performance of physical activity

Resource title: Body in Motion

Credits: 5

Teacher guidelines

The following guidelines are designed to ensure that teachers can carry out valid and consistent assessment using this internal assessment resource.

Teachers need to be very familiar with the outcome being assessed by Achievement Standard Physical Education 90963. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing students against it.

Context/setting

This activity requires students to participate in a ‘discovery’ programme that enables them to deconstruct skills within their choice of sports and to be able to demonstrate comprehensive understanding of how the body functions in the performance of specific sports/skill(s).

The sports/skill(s) chosen and student evidence of their understanding need to incorporate aspects of anatomy, biomechanics and exercise physiology.

The discovery programme needs to be preceded by a teaching and learning programme that is lab-based (practical).

The student will need to practically demonstrate and write or verbally articulate their understanding of the skill/s and how the body functions within the performance of them. Students must make observations and draw conclusions about aspects of the three key areas: Anatomy, Biomechanics and Exercise Physiology. For exercise physiology, students may need to relate this to the sport as a whole and the position they would play.

For supporting evidence, teachers will record any verbal assessment using a dictaphone, digital recorder or video recorder.

Conditions

This assessment activity will take place at the conclusion of the unit in the form of a written test/report over a couple of classroom sessions. Students will be able to use the information they have gathered during the practical lab sessions to help answer the questions.

Resource requirements

* Gymnastics equipment.

FAIRFIELD COLLEGE

Achievement Standard Physical Education 90963 (1.2):

Demonstrate understanding of the function of the body as it relates to the performance of physical activity

Resource title: Body in Motion

Credits: 5

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| --- | --- | --- |
| Achievement | Achievement with Merit | Achievement with Excellence |
| Demonstrate understanding of the function of the body as it relates to the performance of physical activity. | Demonstrate in-depth understanding of the function of the body as it relates to the performance of physical activity. | Demonstrate comprehensive understanding of the function of the body as it relates to the performance of physical activity. |

|  |  |
| --- | --- |
| **NAME:** |  |
| **CLASS** |  |
| **TEACHER NAME:** |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task** | **N/A** | **Achieved** | **Merit** | **Excellence** |
| 1a. Biomechanics |  |  |  |  |
| 1b. Exercise Physiology |  |  |  |  |
| 1c. Anatomy |  |  |  |  |

FINAL GRADE:

Teacher signature­:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Declaration

I confirm that I have read and understand the conditions and requirements of the assessment and have had an opportunity to get any clarification that I need from my Teacher/Assessor.

All work completed for this assessment is my own work and has been produced without any assistance from anyone else. I also confirm that the procedure for appealing a grade and opportunities to reassess have been outlined to me.

Signed:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Student) Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student instructions

Introduction

This assessment activity requires you to be involved in Gymnastics over a period of 6 weeks (2 periods in class 2 in the gym).

You will use different skills within gymnastics to demonstrate your understanding of three aspects of the functioning body: anatomy, biomechanics, and physiological responses.

You will be assessed at the conclusion of the unit.

You will do this verbally (on video) or written.

You will be assessed on the depth and breadth of your understanding of how the body functions in performing physical activity.

Task

You will participate in gymnastics over a period of 6 weeks.

During this time you have to analyse what is happening in the performance of gymnastics activities. You need to practice the following activities and analyse them during practical sessions:

* The vault
* Balance beam
* Trampoline
* Mini tramp
* Floor routine

**Assessment Task**

The practical activities will be finished at the end of week eight. At this point you will be doing a written assessment in class. You will be required to write a written response to show your understanding of the function of the body as it relates to the performance of gymnastics. Your teacher will choose the activity for you to analyse (from the list above). An assignment booklet will be provided for you to write your answers in. This will remain in class. During the assessment you will be able to use any notes you have taken during class time to help formulate your answers. You cannot take your assessment books home.

Use the following questions during your practical sessions to help demonstrate your understanding.

Basic Anatomy

You need to develop responses to the following:

* What type of movement is occurring at your joints?
* In your movements, what are the agonist and antagonist muscles?
* What are the supporting muscles being used?
* How do these muscles work together to help create your movements?

Basic Biomechanics

You need to develop responses to the following:

* How does the concept of projectile motion affect your activity?
* Do any of Newtons Laws (Inertia, Acceleration, Action/Reaction) affect your activity and how?
* How does force summation relate to your activity?
* How does balance and stability affect your activity?
* What type of levers are involved in your activity and how do they affect it?

Basic Exercise Physiology

You need to develop responses to the following:

* What is the major energy system used in your activity or sport and how does it work for you?
* Can you explain the short-term physiological responses you will experience during your activity and why these occur?
* If you were to be involved in gymnastics training programme over a period of time what physiological adaptations might you expect to see?

Assessment schedule: Physical Education 90963 Body In Motion

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| Evidence/Judgements towards Achievement | Evidence/Judgements towards Achievement with Merit | Evidence/Judgements towards Achievement with Excellence |
| The student demonstrates understanding of the function of the body as it relates to the performance of physical activity. This means that in completing this activity, the student:   * completes a range of suitable large muscle locomotor-type physical activities involved in sport or exercise, e.g. fitness, dance, outdoor education, games, team-based sport, te ao kori etc. * observes how their body functions in these activities * gives an account of, and/or gives details of, more than one characteristic of how the human body works in relation to physical activity, e.g. the way a joint moves in a specific physical activity; changes in heart rate, blood pressure, etc: *“Sweating occurs when… When I sweat, sweat glands … to cool my body.”*   These include but are not limited to:   * basic functional anatomy, e.g. anatomical movement, bones and muscles involved in the movement, agonists, antagonists * basic principles of biomechanics (depending on the context used), e.g. stability, force summation, levers * basic physiological responses to large muscle locomotor-type activities (depending on the context used) for example, acute and chronic response to training, energy systems.   For example:  **Anatomy**  (For a kicking motion)  *In the preparation phase of the kick there is hip abduction, rotation and extension. The hamstring and gluteal groups allows for upper leg extension and the quadriceps muscle group contract to bring the lower leg forward to kick the ball. This is called extension.*  **Biomechanics**  (For a kicking, serving, hitting motion)  Please note: this is a very simplistic response. More detail is needed for a convincing response.  *I need to exert enough force on the ball so that I can move it. This is overcoming inertia. The heavier the ball the more force I need to apply.*  **Exercise Physiology**  short-term/acute physiological changes -↑HR, ↑SV, ↑Q, ↑Ventilation, ↑Systolic BP, sweating.  *When I play volleyball my heart rate goes up and I begin to sweat after a short period of time.* | The student demonstrates in-depth understanding of the function of the body as it relates to the performance of physical activity. This means that in completing this activity, the student:   * completes a range of suitable large muscle locomotor-type physical activities involved in sport or exercise, e.g. fitness, dance, outdoor education, games, team-based sport, te ao kori etc * observes how their body functions in these activities * describes (gives an account of, and/or gives details of) more than one characteristic of how the human body works in relation to physical activity, e.g. the way a joint moves in a specific physical activity; changes in heart rate, blood pressure, etc: *“Sweating occurs when… When I sweat, sweat glands … to cool my body.*.*”*   These include but are not limited to:   * basic functional anatomy, e.g. anatomical movement, bones and muscles involved in the movement, agonists, antagonists * basic principles of biomechanics (depending on the context used), e.g. stability, force summation, levers * basic physiological responses to large muscle locomotor-type activities (depending on the context used) for example, acute and chronic response to training, energy systems * explains **why** the body functions in the manner described in performing the physical activities completed, e.g. “*I sweat when I am playing rugby because…”*   For example:  **Anatomy**  (Partial example for a kicking motion)  *In the preparation phase of the kick there is hip abduction, rotation and extension. This means that the hip… because …*  *The hamstring and gluteal groups allow for upper leg extension by… and the quadriceps muscle group contract to bring the lower leg forward to kick the ball. This is called extension.*  *The joint and muscle groups act like this because… If they did not work like this, …*  (Student must explain how the body functions and why it functions in the manner described.)  **Biomechanics**  (Projectile motion for serve)  *I need to exert enough force on the ball so that I can move it. This is overcoming inertia. The heavier the ball the more force I need to apply.*  *I need to exert enough force on the ball so that I can move it. This is overcoming inertia. The heavier the ball the more force I need to apply.*  *If I contact the ball at the top of my hand reach I can serve harder at the opponents. Due to the height of the net this is a flatter serve. If I serve with my hand lower the angle of release is higher and the ball is slower and easier to pass…*  **Exercise Physiology**  short-term/acute physiological changes -↑HR, ↑SV, ↑Q, ↑Ventilation, ↑Systolic BP, sweating.  *When I play volleyball my heart rate goes up and I begin to sweat after a short period of time. It does this because…* | The student demonstrates comprehensive understanding of the function of the body as it relates to the performance of physical activity. This means that in completing this activity, the student:   * completes a range of suitable large muscle locomotor-type physical activities involved in sport or exercise, e.g. fitness, dance, outdoor education, games, team-based sport, te ao kori etc * observes how their body functions in these activities * gives an account of, and/or gives details of, more than one characteristic of how the human body works in relation to physical activity, e.g. the way a joint moves in a specific physical activity; changes in heart rate, blood pressure, etc.   These include but are not limited to:   * basic functional anatomy, e.g. anatomical movement, bones and muscles involved in the movement, agonists, antagonists * basic principles of biomechanics (depending on the context used), e.g. stability, force summation, levers * basic physiological responses to large muscle locomotor-type activities (depending on the context used) for example, acute and chronic response to training, energy systems * explains **how** AND **why** the body functions in the manner described in performing the physical activities completed, e.g. “*Sweating occurs when… When I sweat, sweat glands … to cool my body.* *I sweat when I am playing rugby because…”* * shows breadth and depth of knowledge, by, being able to (for example): * describe and explain how anatomical structure relates to (affects/limits) the performance of a physical activity * use biomechanical principles to explain the performance of a physical activity * describe and explain how physical activity and how the physiological responses (e.g. heart rate) relate to the intensity of a physical activity.   For example:  **Anatomy**  (Partial example for a kicking motion)  Please note: There needs to be further discussion on movement of the hip and the ankle and associated movements and muscles that correlate.  *In the preparation phase of the kick there is hip abduction, rotation and extension. This means that the hip… because …*  *The hamstring and gluteal groups allow for upper leg extension by… and the quadriceps muscle group contract to bring the lower leg forward to kick the ball. This is called extension.*  *The joint and muscle groups act like this because… If they did not work like this, …*  *The quadriceps are the prime mover for extension at the knee and contracts to produce the execution phase of the movement* (can name 4 muscles here). *The hamstrings relax to allow extension to occur then contract towards the end of the movement to slow the extension* (can name 3 here).  **Biomechanics**  (Kicking motion)  Please note: The response needs Achieved and Merit level description and explanation as well.  *When I kick the ball off the tee, the bigger stronger muscles of the upper leg /torso initiate the movement followed by the muscles of the lower leg and finally the foot.*  *To gain maximum force in the kick all muscles will be used. The muscles need to be used sequentially. The fine movements of the muscles in my foot allow for better direction of the ball.*  *The entire movement must be completed over a stable base as this will ensure maximum force. For this my plant foot needs to be under my head when I kick the ball and my shoulder and lead hand need to be forward of this.*  **Exercise Physiology**  *Playing the game of Volleyball is high intensity exercise and uses mainly anaerobic energy sources. A by-product of using anaerobic sources of energy can be lactic acid, which is hard to get rid of. It accumulates in the muscles and blood creating fatigue. Therefore the high intensity exercise can only be maintained for a short time. The break between rallies allows me to recover for the next rally and series of blocks and spikes.* |

Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.

Please note:

**Achieved** comments are descriptions.

Student would have Achieved for each of Biomechanics, Exercise Physiology and Anatomy.

**Merit** comments are explanations.

Student would have achieved Merit level or higher for each of Biomechanics, Exercise Physiology and Anatomy.

**Excellence** comments are comprehensive explanation, showing breadth and depth of knowledge of how the body functions in the performance of physical activity.

Student would have achieved Excellence level for each of Biomechanics, Exercise Physiology and Anatomy.